Effectiveness Through Macros: Transform Your Analyses and Save Time with SPSS Macros

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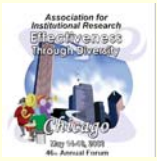

Association for Institutional Research
46th Annual Conference – Chicago, IL
May 16th, 2005

Goals

- Introduce users to SPSS macros, a lesser-known but powerful SPSS process
- Demonstrate several practical applications of SPSS macros in an institutional research office
- Highlight how SPSS can save time by automating repetitive tasks

Outline

- SPSS GUI & command syntax
- SPSS macros & scripts
- Demonstration of 4 practical macro applications:
  - Report Generator
  - Data Case Creation
  - Automated Analysis
  - Data File Creation
- Provide SPSS resources for personal development
- Questions/Discussion

Hypothetical Reporting Situation

- Upcoming campus-wide meeting
- Meeting will focus on results from a student feedback form
- Delivering reports, analyses, and data to departments is needed ASAP

Graphic User Interface (GUI)

- "Point-and-click" environment
- Front-end interface that automatically generates command syntax
- Most GUI processes can be "pasted" to the syntax editor

Command Syntax

- Powerful command language provided by SPSS
- Runs "behinds the scenes"
- Rendered in the third major SPSS window – the Syntax Editor

KEY
Red = SPSS commands
Green = Variables from data file
Purple = Values vary depending upon department (eventually replaced by Macro keyword arguments)

```
*Part I: "Get file" retrieves SPSS data file.

    GET FILE = 'C:\AIR_SPSS_Demo_06.sav'.

*Part II: Flagging of survey respondents for inclusion in appropriate report column: department, college,
university.

    if (dep_code eq 1) depart = 1.
    if (col_code eq 1 and dep_code ne 1) college = 1.
    if (dep_code ne 1) univers  = 1.

*Part III: Setting labels for variables in order to have column headings defined correctly.

    VARIABLE LABEL depart 'English'/ college 'Arts & Humanities'/univers 'University'.

*Part IV: Ctables command syntax puts all the report pieces together (see syntax manual for details).

    CTABLES
    / table (Q1 + Q2 + Q3 + Q4 + Q5 + Q6 + Q7 + Q8) [count colpct]  by (depart + college + univers)
    / categories variables = Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Total = yes
    / Title Title = '2004 Departmental Questionnaire Frequency Distributions: English Department (Senior
    Class)'.
```

Macros

- Allows users to create a basic syntax skeleton which is populated with specified user-created fields (similar to mail merge)
- Constructed with command syntax and executed in the syntax window
- Macros run until all "Macro Calls" have been exhausted—one needed for each department

KEY
Red = SPSS non-macro commands
Blue = Macro commands
Green = Macro Keyword Arguments & Call

*Three Parts to a Macro: Definition, Body, **Keyword Arguments & Call** .

```
DEFINE !FREQ1 (M_depart_name = !charend ('%')
    / M_college_name = !charend ('%')
    / M_depart_code = !charend ('%')
    / M_college_code = !charend ('%')
    / M_depart_name2 = !charend ('%').

GET  FILE='C:\AIR_SPSS_Demo_06.sav'.

if (dep_code eq !M_depart_code) depart = 1.
if (col_code eq !M_college_code and dep_code ne !M_depart_code) college = 1.
if (dep_code ne !M_depart_code) univers  = 1.

VARIABLE LABEL depart !M_depart_name/ college !M_college_name/univers 'University'.

CTABLES
/ table (Q1 + Q2 + Q3 + Q4 + Q5 + Q6 + Q7 + Q8) [count colpct]  by (depart + college + univers)
/categories variables = Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Total = yes
/Title Title = '2004 Departmental Questionnaire Frequency Distributions (Seniors Only):'  !M_depart_name2.

!ENDDEFINE.
```

***Macro Call**—To feed the macro, start with the macro name ("!Freq1") and then specify values for each keyword argument:
!FREQ1 **M_depart_name** = English % **M_college_name** = Arts & Humanities% **M_depart_code** = 1%
M_college_code = 1% **M_depart_name2** = English Dept%.

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Scripts

- SPSS scripts program tasks that cannot be done with command syntax, including:
  - Bold lines in a report
  - Print reports
  - Save output
- Scripts use Sax Basic programming language
- Scripts are created and modified in the fourth major SPSS window, the script window

Macro #1 – Report Generator

- ISSUE: Individual departmental reports need to be generated using the same general template
- Different labels are needed for each report
- All reports draw from same data file
- DESIRED OUTPUT: Formatted departmental reports saved to specific locations on file server

Macro #2 – Data Case Creation

- ISSUE: A student-level data file needs to be aggregated into a department-level file, providing College and University comparison information
- Summary statistics calculated using the SPSS AGGREGATE command
- Each department needs a unique case entry
- DESIRED OUTPUT: An aggregated department-level file, holding the department's results out of the College and University comparisons.

Macro #3 – Automated Analysis

- ISSUE: Results for department-specific regression models predicting "satisfaction" need to be compared side-by-side
- GUI is a difficult and tiring way to generate these analyses
- What if after running and manually formatting results for 35 models you find a mistake?
- DESIRED OUTPUT: A series of regression model output, with saved coefficients, st. errors & sig. signs

Macro #4 – Data File Creation

- ISSUE: Each department needs a saved copy of their final dataset
- Selecting out specific data "cuts" from a raw file for each department would be tedious
- DESIRED OUTPUT: Department-specific data files saved to folder on server for dissemination.

Summary

- IR offices are increasingly asked to find ways to "work smarter"
- SPSS macros can standardize most institutional research demands and alleviate drudgery
- Use your imagination—macros can be used in many different ways

References

- Levesque, R. (2003). *SPSS Programming and Data Management. A Guide for SPSS and SAS Users.* Chicago, IL: SPSS Inc.
- www.spsstools.net
- Programming with SPSS Scripts – An SPSS Training Manual
- SPSS User Manuals & Command Syntax Reference

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